



# **PIPELINE SAFETY MANAGEMENT SYSTEM**

**API RECOMMENDED PRACTICE (RP) 1173**

**Steve Prue – City of Ellensburg**







**Marshall, MI oil spill  
July 26, 2010**







**San Bruno Pipeline Explosion  
September 9, 2011**



# Recent History

Pipeline incidents in 2010 and 2011 revealed management system weaknesses as contributing factors. The NTSB Marshall, MI incident report stated:

“Evidence from this accident and from the San Bruno accident indicates that company oversight of pipeline control center management and operator performance was deficient.”

The agency found that a Pipeline Safety Management System would improve performance through top management leadership.

# NTSB Recommendations

Implementation of SMSs in transportation systems by elevating SMSs to its Most Wanted List.

SMSs continuously identify, address, and monitor threats to the safety of company operations by doing the following:

- ❖ Proactively address safety issues before they become incidents/accidents.
- ❖ Document safety procedures and requiring strict adherence to the procedures by safety personnel.
- ❖ Treat operator errors as system deficiencies and not as reasons to punish and intimidate operators.
- ❖ Require senior company management to commit to operational safety.
- ❖ Identify personnel responsible for safety initiatives and oversight.
- ❖ Implement a non-punitive method for employees to report safety hazards.
- ❖ Continuously identify and address risks in all safety-critical aspects of operations.
- ❖ Provide safety assurance by regularly evaluating (or auditing) operations to identify and address risks.

# Regulator's Role - A State's Perspective

- ❖ To assist in developing a “standard” that allows the operator to build upon existing plans already in place.
- ❖ One which will provide a framework for those companies looking to establish a system
- ❖ To assure that the process is able to integrate existing regulatory requirements into the SMS process.

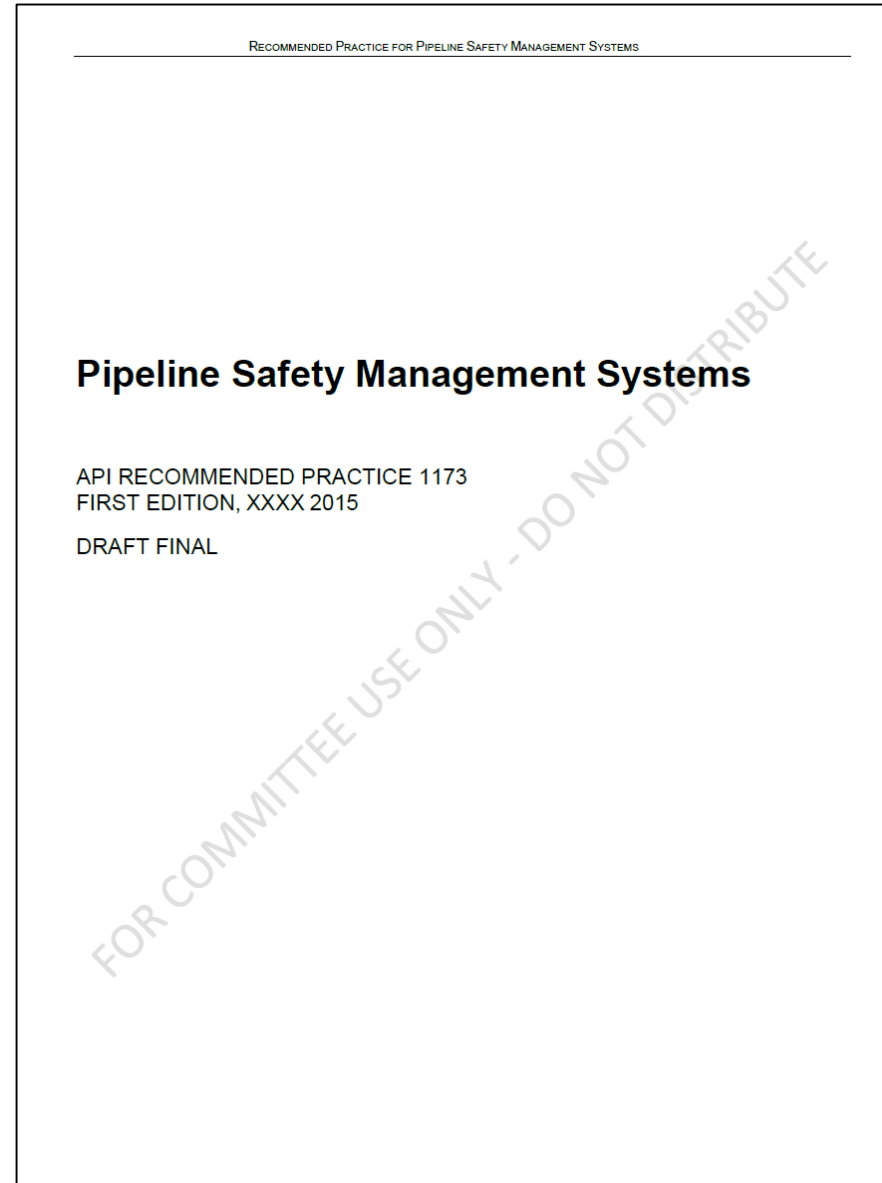


# Regulator's Role - A State's Perspective

- ❖ Scalability, many standards just do not fit into the plans of smaller operators.
- ❖ SMS must be applicable to the largest number of operators possible, regardless of size.
- ❖ As state regulators it is our duty to assure the same level of safety and reliability of service exist for every customer within our state.

# Industry Perspectives

- ❖ The pipeline industry (both natural gas and hazardous liquids) has previously considered Safety Management Systems to assure that adequate processes exist to protect the public, the environment, employees, and contractors.
- ❖ Many pipeline operators have highly evolved management systems but lack of industry guidance may cause gaps between operators and ranges of quality and comprehensiveness.



# Operator's View

## ❖ Check the Checker

- Commitment
- Policy
- Controls

## ❖ Not intended to replace existing processes

- IMP
- Employee Safety

## ❖ Comprehensive view of what to do.

## ❖ Not how to do it.



# The Goal is Improved Safety

Pipeline safety stakeholders in conjunction with the American Petroleum Institute (API) have been working for over 2 years to develop a comprehensive framework of recommended practices for pipeline safety and integrity procedures across the United States.

Result: New API Recommended Practice RP 1173 Pipeline Safety Management System specific to pipeline operators across the United States.

Key components of RP 1173

- How top management develops processes to reveal and mitigate safety threats
- Provide for continuous improvement
- Make compliance and risk reduction routine

# Participants who Worked to Develop the SMS Recommended Practice

- Ron McClain, Kinder Morgan Energy Partners,  
(Chair)
- Mark Hereth, P-PIC, Content Editor
- Edmund Baniak, API (Standards Support)
- Robert Miller, AZ Corporation Commission
- Paul Eberth, Enbridge Pipelines
- Linda Daugherty, PHMSA (alternate)
- Brianne Metzger-Doran, Spectra Energy
- Nick Stavropoulos, Pacific Gas and Electric
- John Bresland, Public – Subject Matter Expert
- Stacey Gerard, Public – Subject Matter Expert
- Massoud Tahamtani, VA State Corporation Commission
- Kate Miller, AGA
- Scott Currier, INGAA
- Peter Lidiak, API
- Jeff Wiese, PHMSA
- Bob Beaton, NTSB (Ex Officio)
- Tracey Scott, Alliance Pipeline
- William Moody, Southwest Gas
- Steve Prue, Small Gas Distr.
- Scott Collier, Buckeye Partners
- Tom Jensen , Explorer Pipeline

# Direct Participants

- 4 – Liquids Pipelines
- 4 – Natural Gas Pipelines
- 1 – Municipal Distribution
- 3 – Trade Organizations
- 4 – Regulators
  - 2-PHMSA
  - 2-NAPSR
- 1 – NTSB
- 3 – Public – SME's
- 1 – Contract Engineering
- 1 – Standards Organization
- \* Plus alternates



# The Goal is Improved Safety

## **RP 1173:           General**

This recommended practice provides guidance to pipeline operators for developing and maintaining a pipeline safety management system (PSMS).

It builds upon and augments existing requirements and is not Intended to duplicate requirements of any other consensus standard or regulation.

While no one can predict future events, this RP was not developed with the intention of it becoming a regulation, it is our intention and hope that RP 1173 will be widely accepted by industry and implemented.

# The Goal is Improved Safety

## **RP 1173: General**

Safe and effective pipeline operations requires awareness and management of many linked activities. These activities include but not limited to designating, constructing, operating, maintaining and managing the pipeline.

Major accidents with high consequences rarely occur due to a safety breakdown of a single activity but instead occur because of an alignment of weaknesses across multiple activities.

While safety efforts may be applied individually to each activity more effective safety performance is achieved when viewing the linked activities as processes.

# The Goal is Improved Safety

## RP 1173: Flexibility

- The framework is to be applied with flexibility to account for the current state of development of a particular element of management system within a company.
- In a company with an existing comprehensive PSMS is can serve as a basis for comparison and review between the RP and the operators system.
- In a company with a partial but not a comprehensive PSMS the RP will provide a means to integrate and add to those efforts to establish a comprehensive PSMS.
- For those companies without any elements of a PSMS adoption of the RP would provide to them a starting point from which they could build a comprehensive PSMS.
- In all cases, operators are intended to have the flexibility to apply this RP as appropriate to their specific needs.



# **The Goal is Improved Safety**

## **RP 1173: Scalability**

- The framework of 1173 is also intended to be scalable for pipeline operators of varying size and scope.
- We recognize that the size of operators can vary from thousands employed by the larger operators to only a few employees employed at a small LDC or municipal operator.
- The 10 essential elements comprising the framework of 1173 apply to organizations of any size.
- The framework elements and the principles underlying it are broadly applicable, and strongly recommended operators of all sizes.
- The level of detail in each pipeline operator's PSMS should be appropriate for the size of their operation and the risk to the public and environment.

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  - The level of detail in each pipeline operator's PSMS should be appropriate for the size of their operation and the risk to the public and environment.
- “For very small operators with a handful of employees, adoption of all provisions within this RP may not be practical. However, even small operators can build on selected provisions herein.”

# **The Goal is Improved Safety**

## **RP 1173: Essential Elements**

- Leadership and Management Commitment.
- Stakeholder Engagement.
- Risk Management.
- Operational Controls.
- Incident Investigation, Evaluation and Lessons Learned.
- Safety Assurance.
- Management Review and Continuous Improvement.
- Emergency Preparedness and Response.
- Competence, Awareness and Training.
- Documentation and Record Keeping.

# The Goal is Improved Safety

## RP 1173: Safety Culture

- Safety culture is the collective set of attitudes, values, norms, and beliefs that a pipeline operators employees and contractor personnel share with respect to risk and safety.
- A positive safety culture is one where employees and contractor personnel collaborate; have positive attitudes towards compliance; feels responsible for public safety, for each other's safety, and for the health of the business; and fundamentally believe in non-punitive reporting.
- Maintaining a positive safety culture requires continual diligence to address issues including complacency, fear of reprisal, over confidence, and normalization of deviance.
- A positive safety culture can exist without a formal PSMS, but an effective PSMS cannot exist without a positive safety culture.



# The Elements

## ❖ **Leadership AND Management Commitment**

- Top management shall establish goals and objectives.
- Commitment expressed as policy.
- Documented roles and responsibilities of management.
- Create a culture of two way communication throughout organization and contractors of SMS commitment.

## ❖ **Stakeholder Engagement**

- Regulatory interaction.
- Public awareness programs.
- Pipeline and Informed Planning Alliance (PIPA).
- State Pipeline Associations.
- Pipeline Association for Public Awareness (PAPA).

# The Elements

## ❖ Risk Management

- Integrity management programs.
- Other relevant data sources.

## ❖ Operational Controls

- Procedures.
- Standards.
- Management of change.

## ❖ Incident Investigation, Evaluation and Lessons Learned

- Incident debrief.
- Procedure and components review/revision.
- Organizational communication as needed.

# The Elements

## ❖ Safety Assurance

- Quality control activities.
- Key performance indicators.
- Operational Quality Assurance.
- Continuous improvement loop (activities and SMS).

## ❖ Management Review and Continuous Improvement

- Annual reviews by top management.
- Evaluate if performance goals and objectives have been met.
- Ensure risk management effectiveness and improvement.
- Recommendations for improvement are integrated into next iteration of PSMS plan.

# The Elements

## ❖ **Emergency Preparedness and Response**

- Emergency response plan.
- Emergency response training facility.
- Liaison with first responders.

## ❖ **Competence, Awareness, and Training**

- All personnel including contractors have the necessary knowledge, skills, and experience.
- Provide training to enable development and implementation of PSMS elements.
- Establish a training schedule to ensure personnel and contractors are updated.

## ❖ **Documentation and Record Keeping**



# Plan, Do, Check, Act – The Core of the Standard



**Continuous Improvement is the Goal of the Standard**

# Plan, Do



## Plan:

Management commitment and leadership

Data gathering and evaluation of quality

Risk identification

Risk Mitigation

Training, Qualification and Development

## Do:

Risk Mitigation

Operational controls

Documentation and record keeping

Stakeholder engagement

# Check, Act



## Check:

Incident investigations, evaluations and lessons learned.  
Safety assurance and continuous improvement.  
Results of previous actions.

## Act:

Address shortcomings.  
Continued Improvement.  
Management Review.

# Maturity Model



SMS is a journey

It is essential to measure progress

Evolution may include

1. Minimal compliance – lack of management involvement
2. Commitment to compliance – Rules and procedures
3. SMS in place – Individuals seeking risk reduction
4. SMS evolving – Teams continuously improving

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- Risk Management. – DIMP/TIMP?
- Operational Controls. – O&M?
- Incident Investigation, Evaluation and Lessons Learned. –O&M?
- Safety Assurance.
- Management Review and Continuous Improvement.
- Emergency Preparedness and Response. – O&M?, RP 1162
- Competence, Awareness and Training. – O.Q.?
- Documentation and Record Keeping. – O&M, RP 1162, O.Q.,  
DIMP/TIMP?

# Conclusions

- RP 1173, will assist the operator by identifying and addressing safety issues in a pipeline's lifecycle, including the design, construction, operation, maintenance, integrity management and abandonment of pipelines at the earliest stage to prevent conditions that may ultimately result in an incident.
- We are confident that RP 1173 is an SMS that enhances pipeline safety in a practical way while implementing guidelines for continuous improvement.
- All comments have been addressed but not necessarily incorporated into the document. After the comment period, API members voted whether to accept or reject the document as a recommended practice applicable to all pipeline operators.
- It is undergoing a final review by ANSI and we expect it to be published by the end of May.

A white rectangular sign with black text is mounted on a chain-link fence. The sign is held in place by four metal brackets, one in each corner. The text is arranged in four lines, each line containing a single word or a short phrase. The sign is slightly tilted to the right. The background shows the chain-link fence and some greenery.

**WORKING SAFELY  
MAY GET OLD  
BUT SO DO THOSE  
WHO PRACTICE IT**



# Any Questions?

